Notebook Series -- Notebooks by Experimenters Other Than Edison
Navy and Wartime Research Experiments -- Miscellaneous Books
Notebook, N-18-03-13

This notebook was used by William A. Hayes, Newman H. Holland, William De Mille Telfair, and an experimenter named Fehen during March 1918-July 1920 for notes on experimental work done for the military during and shortly after World War I, as well as other research pertaining to sound recording. The notes at the beginning of the book relate primarily to a sound ranging apparatus for artillery. The experimenters listened to artillery being fired at Morristown and Sandy Hook, New Jersey, then returned to the laboratory to make adjustments on the recording apparatus being used. Also included are experiments on a telescribe (a device for recording telephone messages) and a "transophone reproducer." Toward the middle of the book is a series of tests by Hayes on various transmitters, along with sound recording tests involving recording from a reproducer. The entries near the end of the book relate to tests of an electrical recording device using combinations of "Marconi Bulbs," "Navy Bulbs," and "Western Electric Bulbs." The notes indicate that the work was done under Edison's supervision; some entries include descriptions of Edison's comments. The flyleaf contains the notation "Daily Journal of Work at Morristown, Sandy Hook & Laboratory." The pages are unnumbered. Approximately 110 pages have been used.

Mr. A. H. Hodgson
Edison Laboratory
West Orange N.J.

75428

Storms Co.
MFG. STATIONERS.
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Edisphone	403X
New Type Shaving Machine	403-~~X1~~
Specifications, Eng- Photures	
Special tests, & research work	403 ET
Labor + Material for Service tests	403 ST.
Eng- & development work on Telescribe	403-2
Transophone Repeaters- Design	403-14
Development	
New Type Edisphone Design + Development	203-~~X1~~
X Sound Experiments	100-225

Daily Journal
of Work

at Morristown.
Sandy Hook
& Laboratory

Property of:-
~~[illegible]~~
Edison Laboratory
West Orange N.J.

Mar 13th. Built No #3 tower.

Mar 14th 4 mile point
Come to Morristown and took shots #2 station worked fine others did not respond. Found short circuit in wiring.

Mar 15th
Day windy and could not take cannon shots, took shot gun shots and obtained no results because the cut made by the shaking transmitter was deeper than shot.

Mar 16th.
Worked on audion in studio made tests with different transmitters preparing for transmitter tests. Had boxes made and order piping for the range to use to prevent transmitter from shaking.

Mar 18th Temperature 55° 61°
Came to range and took shots at 4 mile - 3 3/4 mile point and obtained no result. Only a faint sound was audible, day slightly windy. No signs at all on records. Prepared to take more shots but watch broke.

Mar 19th
Came to Morristown upon arrival there was a small fire near passengers forward No I station which fanned by the wind caused the entire meadows to burn. Mr Morrison, Cook, Telfair & Johnson acted as firemen and saved No I station from burning by burning around it and clearing the field. The line between No I and No II burned in the aft, while we were taking shots. Took 8 shots but wires had been destroyed and were burned.

Mar 20th.
Repaired line and placed new wire between No I and II stations with telephone & microphone.

Mar. 21st Temperature 58°
Morning removed audion in studio to laboratory, set up and prepared it for experiments.
Took 6 shots in the aft from 4 mile point, shots came in and showed on some of the records. Day clear and little wind with us. Shots were heard on recorders of all but they continually jumped out especially No I and that spoiled for reading.

May 22.
Remained at lab and worked on audion to determine a barometer, standard.

Mar 23
Continued the work.

Mar 25.
Took shots from 4 mile point and recd records on all but No 3 station transmitter not working. On 3rd shot we had to return and beat out fire which threatened to blow up the powder shed. We buried the powder and after the fire was by we returned to that. No damage was done to our wire as we beat it out when the grass became thick. Brought transmitter and coil Entire audion with us.

Mon 26-27-28-29-30
Worked on heart beats, tested to Telfairs heart and adjusted by Doctor Goodstein Determined that our transmitter was more useful and sensitive than Moores transmitter. We studied several transmitters carefully all styles and types but found none any better than the one we are using.

Apr 1
Came to Morristown and set up apparatus again tested out and got everything in working order. After pump had shut down it became too windy for us to take any shots, as the rattling of the transmitters made big dips in the wax. Made bags and packed leather. Cleaned all apparatus.

Apr 2.
Came to Morristown and took 2 shots on second shot our cannon blew to pieces. About one pound of powder the usual charge was put in. One piece of gun flew in machine and the other went under machine just missing Telfair. Coned not find third piece of gun. Returned with pieces of gun and one audion for use in lab. Ordered shot gun blanks

Apr 3. Came to Monastown and searched for 3rd piece of gun which we could not find. It probably blew to pieces (small)

Apr 4.-5-6.
Worked in lab. on surface noise device. Used Condensers and apparatus from Sol. room. Warwick went to Newark for bag for Mr Telfair.

Apr 8
Came to Monastown
Temperature 66°
Took shots at ½ mile point with shot gun. No I & II transmitters worked. No 3 would not work. Due to recorder which jumped. Day was windy and rainy and noise made bigger dips on record than did the shot.

Apr 9.
Took shots from ½ mile point, and in front of microphone. Day was windy and raining. The noise from shaking towers was too big to get shot records.

Apr 10.
Worked in lab on chalk machine and kinetoscope lamps to amplifyfly sound.

Apr 11.
Came to Monastown and tried again to get records but wind blew so we could not distinguish record from noise caused by shake. We got hose and box ready to put transmitter in, stuffed it with cow hair and run hose to transmitter. This improved the shaking noise considerable but sound was not as sensitive

Apr 12.
Day was rainy but we took shots using hose and sound proof transmitters. We got records without much outside noise but it was not as sensitive as it should be.

Apr 13-15-16
Worked in lab on chalk receivers and obtained good results.

Apr 17-
Mr Hoeland came to Morristown experimented with 2 hoses at #3 station, using a transmitter on telephone line at #3. One hose line was with the hose and other without. By experiment we found that hose caused the receiver not as sensitive and a noise with a big volume would be necessary to get a good record. Took several shots from field

Apr 18-19.
Moved apparatus to shanty in field. Remodeled shanty, put in floor, built shelves, levelled off ditch around it, cleaned old ashes from field, removed our machines, tilled all other apparatus and moved all into shanty and Dean's little shanty. We are now out of the coal bath.

Apr 20.
Worked in lab. on chalk receiver.

Apr 22-23-
Continued work on chalk receiver and cleared up water from booth

Apr 24-25-26
Came to Morristown and took shots from different distances from 1/2-1/4 and near to hose. Had good records.
Apr 26. Mr Hoeland came up and adjusted transmitters

tightened the records etc. tested out transmitters and got everything in good order.
The shots we took we listened to so we could determine the shot from other noises. The shot being different than other noises.

Apr 27.
Worked in lab. on records and shaving records.

Apr 29.
Came to Morristown and took shots at 1/2 - and near to transmitter without and with the audion.
We took records so that we could listen to them.

Apr 30.
Stayed at lab. and worked on shaving records, went to see about cannon carriage. Worked on different Pastes & Special for Mr. Holland.

May 1. - 2 - 3
Came to Morristown and took shots at different distances, with & without audion. With & without interfering noises. We then reproduced them on reproducing machine and tried to pick out from other noises. We also lined titles by means of microscope.

May 4 - Stayed at lab.

May 6 - 7 - 8 - 9 - 10.
Continued taking shots as above 1st - 2nd - 3rd Butt using a different no. of cells and different att on record. We are obtaining these records for Mr Holland's new method of picking out shot by listening.

May 11
Worked in lab and on special pastes.

May 13-
Came to Morristown and continued taking shots without audion at different distances and different voices

May 14-15
Worked in lab on special machine for returning to records made by Mr. Holland.

May 16- Went to Summerville with Mr. Telfair.

May 17-
Made shots with and without horn. With & without audion and different distances. Took 6 more shots for reproducing machine.

May 18. Worked in lab on stop machine.

May 20 - to May 24.
Came to Manhattan and took shots at different distances for use on stop machine. Tried special work horn & work pipe. Pipe suggested to be used by Mr. Edison. Tried with & without noises

May 25.
Stopped shots on Mr Hollands stop machine

May 27. Worked in lab on stop machine transferred motor

May 26
Came to Morristown and tried records with & without horn for use on stop machine

May 29 - June 1.
Worked on records, reading them to determine a personal equation. Obtained shots from previous days and worked several. Read them and found personal equation to be quite satisfying. It was quite regular for each man.

June 3 - 4.
Took shots to find out the effect of local noises on the long horn and the pipe. The pipe cut down local noises and the shot also. Could get record at 1/2 mile with pipe.

June 5.
Read records.
for personal equation.
Arranged list for Mr Holland.
Found time interval in the time between shot + time key was pressed

June 6 - 7.
Took more shots to determine distance you can go without horn, with pipe.
Days were both windy so it was hard to determine what distance was best, but could get records at 1/3 mile with one

June 10.
Took shots at various distances to find the best distance with pipe or comparison with horn. The horn seemed to be the best. Obtained records at 1/2 mile with both, but horn seemed to be the best.
Local noises cut out with pipe but evidently the shot also.
Day was rainy and not good for test.

June 11-14
Go Morristown to obtain relative intensities in shots with pipe and horn. Took 500 more shots to obtain the desired distances. Also took local noises into consideration to find their intensities. We found these relative intensities to be with shot about 3 to 1 and with the local noises 10 to 1. We measured the distance out in paces so as to get accurate results.

After taking records and comparisons different days and getting the same results the above conclusions were found.

Our wires were disconnected between No 2 station so as to prevent the bean-field to be flooded.

June 13.
Worked in lab.

June 17-18-19
Worked in lab on new materials, went to Long Island for material.

June 20.
Went to Morristown to verify our records of June 11-14. and checked by getting three same experiment the results were very much the same.

June 21.
Went to Morristown and tested out 2 new horns, one a long one with a flare of about 7 inches and another about same aperture but much shorter.

Tried each with local noises and found them to be of the same intensity as the reg. horn at 2/3 its distance.

Tried all three horns, long short & reg. horn at 1/3 while got. good records on long &

short zinc horns, but no record with Reg horn at same distance.
Also took shots so as we can listen to shots with pipe, reg horn & long & short zinc horns.

June 22.
Field day.

June 24-
went to Mineola to get Mr Selfair's apparatus.

June 25
Went to Morristown to obtain a lot of records for listening purposes. Shot to be clear and distinct so as it would be easily to find which sounds more like a cannon shot, either Reg. horn, zinc horns & pipe both and without the audion. obtained several of each.

June 26-
Went to Morristown to fix horses, unable to do so but were able to make cartridges. Farmers were still fixing manfield.

June 27-
Mr Helland came to Morristown and we tested out recorders and transmitter and got everything working O.K.

[illegible] June- [illegible]
[illegible]

Aug 5

Aug 5 Drove to Sandy Hook and made observations from C Tower got time records on 8 in. chrono then drove back to Lab.

Aug 6
Arrived at Sandy Hook and made arrangements for living and stage for machine.

Aug 7 Went out on Hook and Maj - Fields and made arrangements for surveying base line etc.

Aug 8 Had base line laid out and made arrangements with telephone Co. to put poles and wires, and bought house from Amsterdam Bldg. Co.

Aug 9 Had house moved and telephone co. put up poles

Aug 10 Telephone co putting up poles. Aug 11 and 12 drove to Orange and brought down the recording output etc.

Aug 12 Felon came down and we carried in all of the apparatus and unpacked it.

Aug 13 Cleaned up and assembled recording machine, drawing machine & Microscope + etc + started wiring machine.

Aug 14 Finished wiring machine and put up transmitter and got everything ready to start taking shots. Felon went back to Lab.

Aug 15 made list of what things we needed and put up stuff and got things straightened up in shack.

Aug 16 Drove to Orange got things that we needed & Mr Holland came back with me.

Aug 17 We tested out transmitter and recorder but there was no firing.

Aug 18 Had arrangement with C. Lowe to fire machine with flare when I signaled going to shoot but we only had a flare for [illegible] flare was not very good and could not see signals.

Aug 19 Went to Orange and got telescope.

Aug 21 Tried to [illegible] with telescope [illegible] so much wind between [illegible] and it was so hard on the eyes we [illegible] that we only got one shot.

Aug 22 [illegible] have automatic [illegible] without success

[illegible]

Aug [illegible] [illegible] [illegible] [illegible] [illegible] mentium [illegible] records [illegible] was no [illegible].

Aug 26 Took a new [illegible] [illegible] [illegible] [illegible] [illegible] had difficulty in reading [illegible]

Aug 27 [illegible] more [illegible] but still had some trouble with [illegible]

Aug 28 [illegible] [illegible] [illegible] [illegible] [illegible] were [illegible] and [illegible] [illegible] [illegible] were not good shots

Aug 29 Made a few adjustments on Machine, Saw Major [illegible] [illegible] [illegible] to, Colonel [illegible], [illegible] Hill Beach, + Wallace [illegible] looking over the points for new Base line.

Aug 30 Drove to Orange to Mr. [illegible] [illegible] got [illegible] set of Storage [illegible] + 25 [illegible] [illegible]. Started back but had trouble with machine and had to stay in Newark over night.

Aug. 31 Drove [illegible] to [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

Sept. 2 [illegible] [illegible]

Sept. 3 Had [illegible] [illegible] got six [illegible] [illegible] [illegible] [illegible] [illegible] word that we [illegible] [illegible] [illegible] put up poles [illegible] [illegible] [illegible] and [illegible] [illegible] [illegible] ground.

Sept. 4 Saw Major [illegible] and made arrangements for having poles put [illegible] and got Four good Shots.

Sept. 5 Very strong wind blowing against us and were unable to get any shots.

[41]

Sept. 6 Rained all day. Had new typewriter + roller put on machine (and) and adjusted.

Sept. 7 In the morning I got six shots and Mr. Holland came down in the afternoon and we read a few shots and tested out recorder + seismometer.
Dry 68° Wet 64°

Sept 9 Read shots taken on the third and sent reading in to Mr. Holland. Gas posts were put up and all wiring off the ground.

Sept. 10 Read shots taken on the fourth + fifth and sent reading in to Mr. Holland

Sept 11 Took 15 shots but it was very windy. On #3 there was so much noise caused by the wind that it was difficult to read.
Dry 64° Wet 58°

Sept. 12 Read shots taken on the eleventh of which only five could be read. Sent reading into the Lab.

Sept 13 (Cont.)

Sept 14 Mr. Holland came down and we worked on recording machine, adjusted old microphone and put it up but there was no firing.

Sept 16 Took several shots with microphone at #1 station to see if it made a more definite shot.

Sept. 17. Took transmitters all down and adjusted them and got them working fine.

Sept. 18 Went down to get some shots but there was no firing.

Sept. 19. Rained hard all day no firing.

Sept. 20 Got 15 shots which looked fine but didn't have time to read them.

Sept. 21 Mr. Holland came down and we tried using pipe on place of ham to cut down local noises which it did but found it unnecessary also, read live shots and Mr. Holland took the readings to figure.

Sept. 23 Read shots taken 9/20 and sent reading into the Lab.

Sept. 24 Finished reading shots taken 9/20 and sent readings into Lab.

Sept. 25 Saw Mr. Bauer about finding distance from Proof Battery to one of our Stations and he gave me approx. distance of 4506 yds from our East Stake to "A Tower" approx. 50 yds correction for Runs on proof battery + 250 " " " 12" Barbette " (256 mi.)
Not Seven shots. Temp. 65°

Sept 26 Rained all day. Read shots taken 9/25 and sent reading into Lab.

Sept 27 Very windy all day and there was only a few shots fired. Cleaned and oiled machine.

28 Mr. Holland came down. Worked on Microscope, transmitters, recorders etc.

30 Rigged up apparatus for recording the sound through the ground but there was no firing.

Oct 1 Wired up special transmitter worked on reading instrument but there was no firing. Tool broke down.

Oct. 2 Not in shot with transmitter at bottom of pole but they were small shots so didn't make very good records.

Oct 3 Worked [illegible] as there was no firing in [illegible] and I couldn't get [illegible] adjusted just right in the morning.

Oct 4 + 5, 7 Worked in Lab.

Oct. 8 Mr. Holland came back to the Hook area and we proceeded with reading of the records.

Oct 7 Mr. Howard came down to the hut and we got things ready to make ground test but the only fired two shots in the afternoon and forgot to [illegible]

Oct 10 Read over instruments and [illegible] on guidance. The tuning [illegible] a just [illegible] hour out over [illegible]

Oct 11 No firing. Made a preliminary test on machine gun [illegible] finder.

Oct 12 No firing. Went in to Lab to do [illegible] work.

Oct 14 [illegible] have time to read same.

Oct. 15 Only got a shot as it was very windy. Unable to get any test through the ground.

Oct. 16 Got two shots on the ground test and three regular shots.

Oct 17 Read shots Target 14-15-16 Gear broke on spring motor.

Oct. 18 No firing drove in to Lab. took the microscope & cylinders in and studied them.

Oct 19 Studied cylinders and had winding Gear made.

Oct. 20 (Sandy Hook) Put Gear on Machine and got several shots but had trouble getting our signals from "A Tower" & missed the best shots.

Oct. 22 No firing in the morning had over cylinders and studied the timing.

Oct. 23 No firing in the morning on account of fog. Adjusted speaker & transmitters and got 16 good shots Temp. Dry 51° Wet 51° Humidity 20%

Oct 24 No firing in the morning on account of fog. In the afternoon we got about eight shots and then

They stopped firing on account of the temperature of the powder. Temp. Wet 48° Dry 61

25 No firing in the morning on account of fog. Mr. Holland + I (Wm) read shots and brought microscope ~~back~~ and cylinders back to the lab.

26 Worked in Lab. Experimenting coloring cylinders to determine if it would make the records easier to read under the microscope.

28 Drove back to Sandy Hook. No firing in the morning until about eleven o'clock. Tested out transmitters and found that the ones at Stations 2 + 3 were not working, adjusted same but was unable to get any shots.

29 Got seven shots of 5" 6" + 14" guns but they didn't come in very well owing to the direction of the wind which was blowing at 12 miles per hr. against us. Temp 67°

30. Mr. Holland came down to the hook and we adjusted transmitters recording etc. Tried electrical firing fork which Mr. Holland made and found it very good.

31 Got several (11) good shots of 10" guns, Shaved all the cylinders that need shaving.

Nov. 1 Drove in to Orange and worked in Lab. Reading records.

Nov. 2 Worked in Lab. on new recorder.

Nov. 4 Drove back to the Hook but was unable to get any good shots as the motor on the recording machine went wrong.

Nov. 15 Drove back to Orange and brought the recording machine in to the Lab. to overhaul it.

Nov. 6 to 25 worked in lab. overhauling recording machine, experimenting with liquid transmitter, coloring cylinders

and working on electrically operated tuning forks.

Nov. 26 Drove down to Hook and checking up blue print and layed out our base line on same.

Nov. 27 to Dec 3 rain

Dec 4 Drove down to Sandy Hook and packed everything not absolutely necessary for a straight test. (and brought them back) Saw Col. Rust and made arrangements for having pictures taken of our apparatus. Stayed down over night as it was so late when I got through there.

Dec. 5 Drove back to Orange and carried all our things up in the office. Unpacked audions in studio and brought them over to the lab.

Dec. 6 Unpacked Storage Battery and set up audions in Laboratory.

Dec. 7 Worked in Laboratory on electrical recording.

Dec. 9 Drove Mr. Holland to Newark to get some things and worked in Lab. on Electrical recording + showing records.

Dec. 10 Drove down to Sandy Hook saw Mr. Berger and gave him final instructions for taking pictures. Had trouble with Ford and had to stay over night.

Dec. 11 Took down our horns and transmitters and brought everything back to the Lab. but the wire on the poles.

Dec. 12 Unpacked everything I brought back from the Hook and showed all of the cylinders from there. (turned in [illegible])

Dec. 13+14 Worked in Lab. on Electrical tuning forks to get beats

Dec. 16+17 worked on tuning forks.

Dec. 18 Worked in Laboratory, Reading records of beats obtained by running "A" tuning fork + "C" fork to same recorder.

Dec. 19 Drove to Morristown to see what powder or an other [sic]

things we had left true.

Dec. 20+21 Worked in Laboratory on liquid transmitter.

Dec. 23+24 Worked in Lab. on liquid transmitter.

Dec. 26-27-28 Worked in Lab. on steel knife + testing special cylinders

Dec. 30 Worked in Lab. testing special cylinders.

Dec. 31 + Jan 2+3 Worked on liquid transmitter (12/31) move to Hunter with folks

Jan. 4 Worked in Lab. filing old letters.

Jan. 6 Filing letters

Jan. 7 Setting up Telescribe with special transmitters for recording gun sounds

Wed. Jan 8 Filing letters + sorting out combination arms to return to stock.

Thurs Jan 9-19 (sick)

1/10/19 Fri. Sorting out old arms and parts to return to Bowman.

Jan. 11 Sat. Adjusting + testing telescribe to send to "The Hall Co."

Jan. 13 Sun. Repairing and adjusting microscope (5013)

Jan. 14 Mon. Sorting out record points to return to stock and sorting old patent drawings

(Wed) Jan. 15 Adjusting + testing telescribe to be shipped. Dismantling [illegible] (Blue ambrol with celluloid [illegible])

(Thur. Jan. 16) Showing records. Experimenting on new reproducer.

(Fri. Jan. 17) Experimenting on reproducer testing telescribe + testing special cylinders from Silver Lake

(Sat. Jan. 18) Looking up parts needed for stock and tested telescribe for transcribing dept.

Mon. Jan. 20-19 Adjusting telescribe in transcribing dept. Working on new reproducer.

Tue. Jan 21, 19 Adjusting telescribe for transcribing dept. and working on new reproducer.

Wed. Jan 22, 19 Tested telescribe in transcribing dept. (working fine) Made test on special cylinder, putting them in an oven and setting temp. up to 110° Sound-out then recording on same and listening to them to determine the number of times they would reproduce at that temp.

Thur. 1/23 Clearing out closet to make room for telescribe parts and putting telescribe parts away.

Friday 1/24 Tested new double collapsable mandrel. Worked on new transophone reproducer + tested telescribe in Mr. Durand's office and transcribing Dept.

Sat. 1/25 Tested Mr. Durands telescribe + the telescribe in the transcribing Dept. Worked on new transophone reproducer.

Monday 1/27/19 Ordered parts from stock and arranging parts in our stock. Worked on new transophone reproducer making special diaphragm and testing same.

Tue. 1/28/19 Repairing and testing telescribe from transcribing dept which was tipped over.

Wed. 1/29/19 Working on telescribe in transcribing dept. Tested by Durand telescribe. Took aluminum top plate off of Nimrod Earphone to make it a light machine for the salesmen to carry. Worked on transophone reproducer.

Thur. 1/30 Testing special cylinders from Silver Lake.

Fri. 1/31/19 Testing special cylinders from Silver Lake. Tested telescribe in transcribing Dept. + put ~~the~~ new dry cells in same. Special cylinders were as follows XV-60, XV-10-4, XV-10-2, XV-10-0.

Sat. 2/1/19 Making special diaphragms for new transophone reproducer.

CSS

[illegible] Transcribing Dept. [illegible]

[illegible] Made test on telescribe in transcribing dept. Made record of Sease & one of Haywood, both good. Shaved of the records that needed shaving.

Thur. 2/6 Tried Sease + Haywood on Telescribe (both good)

Checked up all Telescribe parts in stock, Oiled & oiled all our Edisphones & Shaving Machines.

Fri 2/7 Tested Telescribes in transcribing Dept & Mr. Durando (both working perfectly)

Tried Lambwood dobber & carpet dobber for clipping bills index slips.

Sat. 2/8 Tested Transcribing Dept Telescribe.

Making up a list of apparatus used on 5013 to check up charges.

Mon. 2/10/19 Working on telescribe recorder to replace the one on telescribe in Transcribing Dept.

Tested cloth (canvas) belts on Edisphone which did not grip as well as the regular leather belts.

Tue. 2/11/19 Working on new recorder for Telescribe.

Wed. 2/12/19 Working on new recorder for Telescribe and putting Telescribe transmitter on Equipoise arm to enable the dictator to sit back in his chair and dictate his letters.

Thur. 2/13 Installed same in Mr. Durando's office. Changed recorder + arm on Telescribe in Transcribing Dept.

Brought Equipoise arm to Sat. [illegible] Mr. Durando.

Friday 2/14 Making an amplifier transmitter in Regular transmitter case.

Sat. 2/15 Adjusting Telescribe to take over to Barnes in New York.

Monday 2/17 Took Telescribe over to N.Y. & set same up in Mr. Barnes office.

Tue. 2/18/19 Working on Telescribe recorder to cut down surface noise. Using regular reproducer stylus & holder mounted on Telescribe recorder. Tried Telescribe in Transcribing dept. (working good)

Wed. 2/19/19 Repairing Telescribe amplifier brought back from Kearney, N.J. Working on Telescribe recorder with special stylus & holder to cut down surface noise.

Testing transcribing dept. Telescribe.

Thur. 2/20 Tested Transcribing Dept Telescribe. Installed sensitive Telescribe transmitter in Mr. Durando office and worked on new sensitive transmitter in a Standard case.

Fri. 2/21 Working on new transmitter

Sat. 2/22 (Washingtons birthday)

Mon. 2/24 Working on New transmitter

Tue. 2/25 Tested transcribing Dept. Telescribe. Finished making up one small transmitter in a Standard case that compared favorably with regular Telescribe transmitter.

Wed. 2/26 Installing new transmitter in Mr. Durando office. Tested Telescribe in transcribing Dept. (working very good) Started making another transmitter.

Thur. 2/27 Tested Mr. Durando's new transmitter & Telescribe also transcribing dept. Telescribe. Tested Thomas Knowles at different angles showing both Edisphone & Dictaphone cylinders.

Fri. 2/28 Trying special recorder attachments to make up 6 simplifier transmitters in Standard Telephone [illegible] cases.

Sat. 2/29 Made two transmitters.

Mon. 3/3/19 Brought Mr. Durando's Telescribe up to the lab. and put new electrode in same and returned to his office. making up two Telescribe recorders and arms.

Tue. 3/4/19 Taking inventory of Telescribe parts in Electrical stock

Wed. 3/5/19 Made up two Telescribe recorders and arms. Tested Telescribe

in transcribing Dept.
Thur. 3/6/19 ~~Worked on~~ Making up two Telescribe Amplifiers and cases.
Fri. 3/7/19 Adjusted Mr. Durando Telescribe for high + low blank and put new switch on same.
Tested Transcribing Dept. Telescribe.
Sat. 3/8/19 Tested Cut & Shaving to send to Roach-Reed Co. (replacement)
Working on Telescribe + Shaving machine.

Mon. 3/10/19 Out Mon. A.M.
P.M. Finished making up another Telescribe amplifier in case.

Tue. 3/11/19 Tested Transcribing Dept. Telescribe + Mr. Durando Telescribe.
Put black leather belt on Earphone with special Hook to test.
Adjusted Mr. Durando Telescribe for High + low cylinder.
Wed. 3/12/19 Worked on shaving machine trying new knives.
Tested Transcribing Dept. + Mr. Durando Telescribe.

Thur. 3/13/19 Tested Mr. Durando + Transcribing Dept. Telescribe.
Worked on new reproducer for transcribing Dictaphone dictation.
Set up Dictaphone shaver + put 160 threads to the in. gear on shaver for tested reproducer to compare both Dictaphone.

Fri. 3/14 Worked on Shaving machine. Special reproducer.
Tested Telescribes.

Sat. 3/15 Worked on special Diagram cutting and testing different knives Mica Diaphrams.

Mon. 3/17 Tested Mr. Durando + Transcribing Dept. Telescribes. Worked on New Reproducer for Dictaphone dictation and also worked on Shaving Machine.
Tue. 3/18 Tested Transcribing Dept + Mr. Durando Telescribe.
Made up another Telescribe amplifier

Wed. 3/19/19 Tested Mr. Durando & transcribing Dept. Telescribes. Shaved all of the cylinders and (about 40) didn't get any Blinds, Worked on Telescribe recorder.

Thur. 3/20/19. Finished telescribe recorder

Fri. 3/21/19 Tested Telescribes. Worked on Shaving Knives.

Sat. 3/22/19 Shaving Knives

Mon. 24 Tue. 25 & Wed. 26 Shaving Knives

Thur. 3/27 Putting recording outfit ready to take over to Columbia St. Studio.

Fri. 3/28 Took recording machine over to Columbia St. Studio, also Dictaphone & Typewriter.

Sat. 3/29 Took the recording, Reproducer, transmitters etc. back to take over to Lincoln.

Mon. 3/31 A.M.
[illegible]

Tue. Apr. 1st, Wed. 4/2, Thur. 4/3, Fri. 4/4 Sat. 4/5 Out Sick.

Mon. 4/7 Worked in [illegible] on recording.

Tue. 4/8 Made special tests on recorders & transmitters in studio to determine which were best suited for our work.

Wed. 4/9 Repairing Bellows and other tubing, fuses, [illegible] (Expander), etc.

Thur. 4/10 (Columbia St. Studio) Worked on [illegible] and [illegible] machines. Also repairing shaving machine.

Fri. 4/11/19 (C. St. Studio) Making up special electrical recorder, and making special tests with recorders & transmitters.

Sat. 4/12/19
Fixed up air tank and took same over to studio also took my cello & another audion board over.

Mon. 4/14/19 (Columbia St. Studio) Had Piano tuned. Changed coils on audion and made tests with electrical recorder.

Tue. 4/15/19 Made contact block for recorder terminals, adjusted shaving machine and shaved some records. Tried electrical recording direct from sounding board of piano with very good results.
Also tried carbon reproducer transmitter.

Wed. 4/16/19 Soldered wires on all of our induction coils. Tried experiments with Gas transmitter, made records of voice, Piano & Phonograph. Filled air tank with water.

Thur. 4/17/19 Made belt for reproducing machine. Put leather strap on chalk reciver. Made records of Phonograph Piano & Voice

Fri. 4/18/19 Making washers of leather & some of tin foil to hold gas in transmitter but couldn't find leather suitable for washers until about 5 o'clock when I went over to studio and happened to to find a piece

Sat. 4/19/19 Made leather washers for transmitters but was unsuccessful in holding gasoline in same.

Mon. 4/21, Tue. 4/22, Wed. 4/23, Thur. 4/24 + Friday 4/25
Trying out large black transmitter and making trial records on Pianola Phonograph, Voice.

Sat. 4/26 Set up reproducing machine in Library for Mr. Edison to listen to some of our records.

Mon. 4/28 Tue. 4/29 Wed. 4/30.
Making Electrical recorder and altering Cam, also making bracket for counter-balance.

Thur. 5/1 Making springs for counter-balance and assembling counter-balance + recorder on machine and made a record of cords on piano which were very good.

Fri. 5/2 Moving all of our things out of the south side of the Studio to make room for Geo. Weiner.

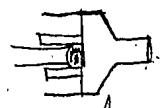
Sat. 5/3 Mon. 5/5 Tue 5/6 Wed. 5/7 Thur. 5/8
Making up 5 electrical recorders and wiring audion for #2 step.

Fri. 5/9 & Sat 5/10
Shaving records + repairing + adjusting reproducing machine

Mon. 5/12 Making tests with five new electrical recorders of which #5 proved the best.

Tue 5/13 to Fri 5/16
Making tests to determine the most suitable transmitter + recorder

Transmitter;-



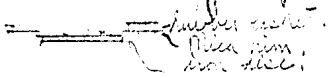
#1, carbon diaphram using #80 mesh carbon granuals + lampblack (mass lampblack) loudest but noisy

#2, carbon diaphram using #80 mesh carbon granuals + lampblack (mass carbon) Good but too faint.

#3 Carbon diaphram using very little lampblack + 80 mesh carbon granuals Best, Good volume with very little noise.

#4 Western Electric standard transmitter with microphone filled with gasoline.
Volume fair and very little noise but the gasoline evaporates very quickly.

Sat. 5/17 to Thur. 5/22
Cutting special recordings.



#1- Mica 1½" dia. .004 thick.
iron disc .011 thick, 3/4" dia. placed
on magnet side of mica.
Recording arm stuck on illuminium
disc .005 thick, 1" dia.
.040 needle.
Quite loud, clear.

#2- Mica 1½" dia. .003 thick
iron disc. 3/4" dia. .011 thick, glued
on mica, recording arm side.
Weak + muffled.

#3- Same as #2 except iron disc
is magnet side of mica.
Voice trial muffled, Piano
quite good but a little weak.

#4- Mica 1½" dia. .0025 thick
iron disc 1" dia. .011 thick placed
on magnet side of mica.
Loud + muffled.

#5- Mica 1½" dia. centre hole 3/4" dia.
iron disc 1⅛" dia. .011 thick placed
on recording arm side of mica.
This is the best, Loud + clear.

#6- Mica ring 1 3/8" dia. .005 thick, hole
in centre 3/4"
iron disc 1" dia. .006 thick
iron disc loose, not [illegible]

Fri. 5/23 Took all of M-8 cells over to the E.S.B.Co. to be charged. Remaking recorders.

Sat. 5/24 Test with carbon diaphragm transmitter using very little lampblack and one cell of battery.

Using two cells we got very good volume & tone but found it not quite steady enough.

Mon. 5/26

May 1919.

Magnetic Recorded used

Mica Ring 3/1000 thick 1 3/16" dia. with soft iron disc 6/1000 thick and 1" dia. fastened on the centre

100 threads to inch

Recording needle 40/1000.

#7 Transmitter

Mixture Bakelite Granules and lamp-black

Regular metal diaphragm

1 Stage Loudon used

#1 record Piano 4 feet from horn 4 feet 6" high

1 cell used

#2 Record same as above only 2 cells used

#3 Record same as above only 3 cells used.

6 Transmitter

Mixture Bakelite Granules and Graphite

Regular metal diaphragm

1 Stage [illegible] used

Piano 4 feet from [illegible]

Recording horn [illegible] 6" from floor

1st Record 1 Cell used

2nd Record 2 Cells used

3rd Record 3 Cells used

#5 Transmitter

Mixture Bauxite Granules and Graphite

Diaphragm Mica ring 1 5/16" dia .003 thick with an aluminum disc 5/1000 thick and 1" diameter fastened on centre

Piano 2 feet from recording horn Recording horn 2 feet 6" from floor

1st Record 1 bell used

2nd Record 2 bells used

3rd Record 3 bells used

#7

Transmitter
Mixture Granules + Lampblack

Diaphragm. Mica ring 3/1000 thick. 1 5/16" dia. ~~steel~~ an aluminum disc 5/1000 thick 1" dia. fastened on centre

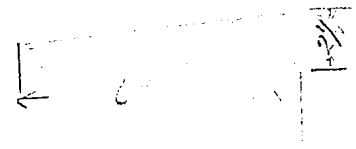
Piano 4 feet from recording horn
Recording horn 4 feet 6 inches from floor

1 record 2 cells used

2 record 3 cells used.

June 10 1911

Tried [illegible] and [illegible] soaked in Gasoline.
Metal diaphragm used in regular [illegible]
Time [illegible] 3" bar



placed in rubber sponge [illegible] piano

1st time small amount of granules floating in Gasoline which could not be filtered.
Then tried adding more [illegible] and found good results were obtained when cup containing granules was 3/4 full and soaked in gas.

Only 1 cell used and results were good
Then tried mica diaphragm in [illegible]

June 10 1909

Track, instead of water depth, and take another second some what longer.

June 11 1909

We now take transmitter apart and find that carbons running same as when put in.

In order to ascertain if experiment can be duplicated, we now clean out the cup holding the granules and put in new charge and fresh supply of gasoline and make new trials as before.

Results same as before

June 12 1919

We now endeavored to get a record on Piano, singing away with horn, leaving nearly all the surface of metal diaphragm in transmitter exposed.

Result: Not so loud as with small horn but still very good.

We now try experiment with out horn but with less of diaphragm surface exposed.

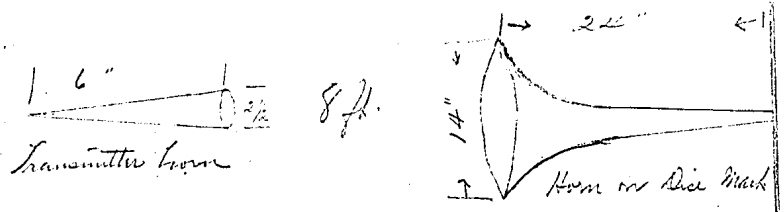
June 13 1919

We now try cutting down the diameter of mica which holds the mica to the front electrode. We take off 1/16" and it seems to give a little more motion.

June 1919

Am E. instructs us to endeavor to get a good record working 6 to 8 feet away from source of sound having a disc record for service.

We have tried all sorts transmitters and using a disc record of Bantrix Voice and working 8 feet away we are able to get a fairly good record as far as quality is concerned, but very break.



Made a number of records with transmitters of Stamled in

Gasoline, Mixtures of different sizes of Granules & Lamp Black using creosote electric holder but fail are too weak for Mr Edison to hear sound through hearing tubes.

We now try working closer in order to obtain a sound loud enough for Mr E to hear.

We first find that the paper diaphragm gives us a hard, thin quality, and therefore tends to eliminate what gave us experiments.

We now use mica diaphragm in the transmitter working 3 feet from source of sound.

Our first experiment under new conditions is with Granules in gasoline, and find that while results are quiet that is may due from carbon mixed the

record obtained in my mouth and after a short time in use the granules become packed and transmitter becomes less sensitive and more uncertain.

Or then try mixture of Granules and Lamp Black and get good results as far as strength and quality is concerned but still record is uncertain.

After trying different thickness of diaphragms in stick transmitter and recorder for to overcome this uncertainty in record we come to the conclusion that it is due to the displacement in the transmitter not allowing freedom enough and therefore decide that the Carbon Electric granule holder or cup cannot be used in this work.

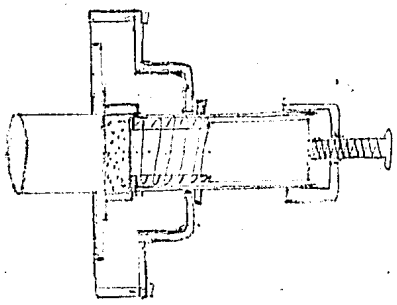
In order to convince myself I now try simple contact

transmitter and while I get a much more sensitive method I am now trusted with the electrode forming orbits and as my disappearance in rifle and I) cannot be not forthcoming.

August 11 1919

Some make up a transmitter as follows.

#1



Mica diaphragm 3/1000 thick
1½" diameter

Copper plated carbon centre
14/1000 thick
1" in diameter

Mixture of Lamp black and Granules held in a felt collar (very soft) against the diaphragm.

Granules #30
Grade O. M.

August 12
1919.

Made Vocal - Violin - Band
Tenor + Orchestra sounded distinct
& just and results very
good that is loud and
good quality if anything
for the open air.

instead of fastening with wax as in regular mouthpiece.
The air chamber between the metal holder and diaphragm is also greatly perhaps double

August 13th 1919

We now make Transmitter #2 following same lines as #1 but increasing diameter of mica and copper plated carbon cups and clamping rubber 2-Backed Mica Diaphragm 2" in diameter and carbon cups 1 3/16" in diameter

Mica. 3/1000 thick
Carbon 14/1000 "

This Transmitter seems to be a much better quality but does not hold as well as #1 also is finicky talk in the horn.

2 Mario Varini

Sept 1919

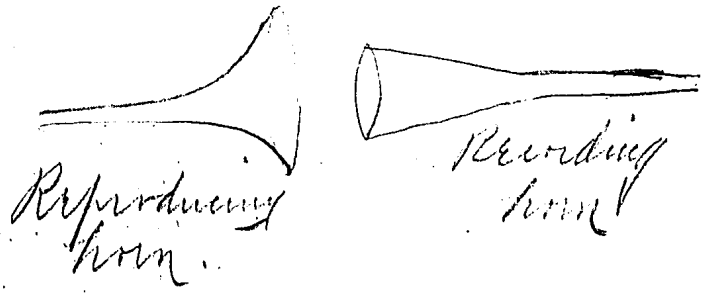
I submitted trials of Violin record to Mr E. and he instructs to use 2 stage Audion in order to increase defects.

Mr E. finds that the tone of Electric recording is somewhat like Victor quality, when comparison is made with mechanical recording.

Sept. 1919

I now use a Naja instead of one on Audion. and find that carbon noises have returned, and records are sharp quality and sound very mechanical.

We now make a record of the violin reproduced, on a disc machine, placing mechanical recording apparatus 6" from the large brass reproducing horn, and thereby get a good loud standard to work to.



Sept. 1919

New Mays.
Working on Microphone —

1 Stage Audion being used.
Tried by different kinds of diaphragms in electric mike.

The diaphragm is made of mica and iron.
Mica 2 mm thick and 1½" in diameter
Iron disc in centre 6 mm thick 1" diameter

The carbon I found the best combination after trying micas from 1½/1000 in thickness up to 7/1000 in and diameters 1" – 1¼" – 1½" – 2".

The arc experiments carried about 1 mile.

Oct. 1919

2 Sept. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] getting a little warm now. and I notice the ground is very hard in places

The Island and mainland perhaps are more to much current on the disappointed and as we have only 1 cell in the circuit Mr. Mayo fitted in a little resistance something in to cut down as much as I desire.

I now try another record and find my surface currents are gone but. bad quality are probably remain

Oct 1919

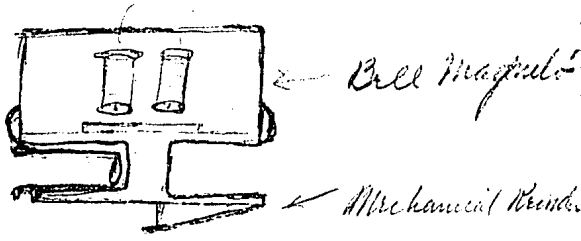
We now try using more lamp-black mixed in with the carbon granules in the transmitter but find that you can go to far and results are weaker and tone no better

After spending several days making trials with different proportions of lamp black and granules I found the best mixture is about 4/5 - Granules 30 to 40 mesh and 1/5 L. Black

Oct 1919

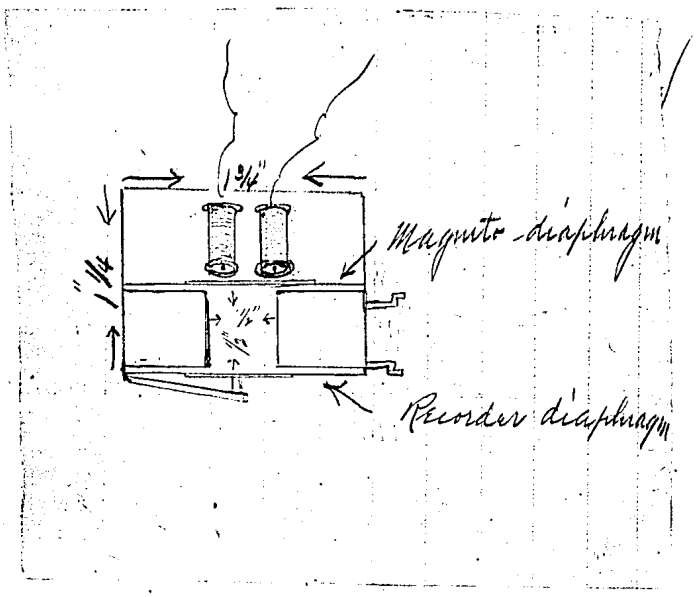
I now go back to electric recorder

I take a regular mechanical recorder and place a Bell magneto so that sound is transmitted to mica dia. as follows.



Diaphragm in Bell magneto 3/1000 mica with 6/1000 Iron disc center 1" in diameter

In first trial I find a big improvement in tone quality but sound does not stand out of the horn as it should therefore, I try different kinds



Magneto Dia
Mica Collar 2/1000 thick
1" 3/4 Diameter
Iron disc stuck on centre with
Beeswax & Resin 6/1000 thick
7/8" diameter

of diaphragms in the mechanical recorder, but results are no better.

I now make up a new recorder following the principal of last experiment, my object is to retain the good quality and make the record stand out.

In the recorder on proceeding page I merely connected a "Bell Magneto" or "watch case receiver" to a regular mechanical recorder, with a small rubber tube, which same would of course weaken and muffle tone, and also make same sound back in turn other reproduced. Therefore construct a recorder on following lines, so that I can try various sizes of tubing between Magneto & Recorder.

I take regular Magneto receiver and solder same to cup such recorder, as per sketch on opposite page, I insert a tube connecting magneto cup, to Recorder top

1/2" inside measurement, the object being to cause sound to pass through same from magnet diaphragm to render diaphragm motion of a recording device from magnet diaphragm, as in my first experiments

My first tube was in length, Magnets 7 Ohms resistance magnets diaphragm mica, collar 2/1000 thick 1 3/4" in diameter and an Iron disc 6 1/2/1000 thick 7/8" diameter

Recorder diaphragm Mica collar 2/1000 thick and an aluminum disc 6 1/2/1000 thick 1 3/4" diameter

Results are very promising and the time is not far off when the mechanical recording I have made electrically I am trying Violin wind and after making several divide to show same to Mr Edison.

After listening to samples of violin and talking records made at distances of 10 - 12 - 15 feet in comparison with mechanical records made at 6", Mr. E. says "very good" - can't hear any cabinet noises now. But piano is somewhat weak in the accompaniment of violin record. and says we should get more volume.

I now decide to use piano for my source of sound and start by making several records at a distance of 2 feet with mechanical recorder, using from 26" long 1/2 oct 1/2 pound. Bell and Octagon. Bell 6" diameter.

I get records good quality and solid
Made 4 records for comparison with Electrically recorded samples.

I now try different lengths of tubing from magneto diaphragm to recording diaphragm and find that if I use anything shorter than 1/2" the tone gets thinner, this also applies to the diameter that is if I go larger than 1/2" in diameter I get fuller and hard while if I go smaller it seems muffled.

Mr E. listened to samples of violin and piano records made at a distance of 15 feet using horn 24 inches long 1/2 octagon 1/2 round bell 7 1/2 inches.
#1 Transmitter 18/16 mica 2/1000 copper disc 6/1000 thick 1" diameter mixture lamp-black + 30 granules.
Recorder #1. 2 stage Audion

Mr E. says very good and now to use 3 stage Audion and when "bugs" are eliminated in 3 stage he feels that we will have recording almost perfect on 2 stage

We now add another stage to Audion making same 3 stage

My first trials are awful hard work with 2 and 3 stage audions and it appears to me that the adding of the 3rd stage has somewhat changed the 2nd stage as my transmitter and recorder do not seem to hold as they did previous to the change.

Mr Edison insists on the use of a record of "Southern Rose Waltz" for source of sound and we accordingly secure a duet - made of drums.

The following experiments I try and bring to see if I can get something to hold the three stage. I of course leave the transmitter alone devoting my work to the recorder and Audion.

In these experiments gaskets + mica fastened with rubber cement.

1st I make a diaphragm of Mica and Aluminum
Mica 1½" in diameter .002 thick
hole in centre ¼"
Aluminum disc 1" in diameter
.007 thick.
Recording needle .005 diameter
2nd + Diaphragm stuck on holder with rubber cement.
Magnetic.
Diaphragm Mica 1½" diameter .002
thick, hole in centre ¼"
Iron disc on centre .006 thick +
1⅛ in diameter
Gasket + Mica stuck with rubber cement
Centre disc stuck with mastic varnish
Result
Too loud and harsh.
#2
I now make changes in magnetic diaphragm and attaching to the same recorder and arm.

Mica 1½" diameter .003 thick, hole in centre ¼"
Iron disc .006 thick 1⅛" diameter
(Result)
Thinner quality but does not seem

to hold any better than #1 and also noisy

#

3 Mica .004 thick 1½" diameter
hole in centre ¼" diameter
Iron disc .006 thick 1⅛" diameter

Result.
Not much difference between #2 + #3. Still noisy and volume about same.

#4 Mica .005. 1½ diameter
hole in centre ¼"
Iron disc .006 thick 1⅛ diam.

Result.
Thinner than #3 in tone but harshness or noise still there

#5.
Mica 1½" dia. .002 no hole in centre.
Iron disc .005 thick 1⅛ diam

Result
Big tone and seems to hold better but

still noisy.

#6 Mica 1½" diam. hole in centre
¼" .002 thick
Iron 1⅛" diameter .005 thick
Result:
Big tone about same as #5.
Too noisy

#7 Mica 1½" diam. hole in centre ¼" .002 thick
Iron 1" diam. .005 thick
Result: more noisy than #6

#8 Mica 1½" diam hole in centre
¼" mica .002 thick
Iron ¾" diameter .005 thick
Result: About same as #7. Noisy.

#9 Mica 1½" diam. hole in centre
¼". mica .003 thick
Iron 1⅛ diam. .005 thick
Result: Good tone, but still noisy.

#10 Mica 1½" diam hole in centre
¼" mica .003 thick
Iron 1" diam .005 thick
Result. Tone good but noisy.

(M)

#11 Mica 1½" diam. .003 thick
hole in center ¼"
Iron ¾" diam. .005 thick.

Results Fine good but noisy.
about same as #10.

I now come to the conclusion that my trouble must be in the Microphone, but as I did not have any trouble with the Lamp-Diaphragm-Granule mixture in my 2 stage experiments I decide to confine my changes to the diaphragm alone.
Transmitter in series.
#1 Mica 1 9/16" .001½ thick.
Copper electrode 1" dia. .006 thick

Results: With 2 stages this combination is very good. Quick, big tone, and stands out, but will not stand 3 stages

#2 Mica .002 thick 1 9/16 diam.
hole in centre 1/4"
Copper disc electrode 1" diam
.006 thick.

Result: Same as #1

#3 Mica .003 thick 1 9/16 diam.
hole in centre 1/4"
Copper disc 1" diam .006
thick.

Result: A little thinner in tone than #2, but not a great deal of difference and it is still noisy with 3 stages amplifier

#4. Mica .004 thick 1 9/16" diameter
hole in centre 1/4"
Copper disc 1" diam .006 thick

Result:
Tone thin but loud. Noise and harshness still remains and there is no less noise in #4 than in #1 so this makes me think that the thickness

of the mica diaphragm makes no difference therefore I start to work on the audion end.

My first trial is to put 2 transmitters in series and I find there is little difference between 1 or 2 if they are alike the same resistance.
I now put them in multiple and this cuts down the force to a great extent.

I now take a small lamp 4 V. and put same in multiple in the circuit and put the transmitter in series, and now I find the noise is eliminated but the results when received are somewhat weak. I now put more cells in the circuit and find that I must use at least 3 cells with 3 stages and 4 cells with 2 in audion that is with the lamp in multiple

Now that I have eliminated the noise and harshness, I think it will be necessary for me to once more make experiments of magnetic & vibrating diaphragms when transmitted through

Transmitter and receiver cells with 2 - 3 - 4 cells.
Cannot use more than 2 cells and with 3 stage even such one would be harsh & noisy. Lampblack matter. More lamp black & larger granules.

Tried transmitter with stretched paper diaphragm, and notice it showed speech too far as quantity was concerned, also the high notes gave me trouble. I then tightened diaphragm and this loosened high notes trouble, but gave me too much middle; that to the after beats or accompaniment showed up loud and hasty.

Jan 24 1920

Now build up a transmitter and film.

The dia. is Mica 2 1/2" diameter .004 thick
The shaded ring is copper .006 thick 1/4" in diameter

Hypothesis in making above is to open away from the diaphragm, and felt ring holding granules + rock must not on the diaphragm, thus preventing the diaphragm from having the elasticity necessary to respond properly to high notes.

Results: Very good and high notes do not trouble but very little if any. I will try thinner diaphragm. (Mica)

C141

Tried Gas Transmitter with different sizes of diaphragms.

The gasolene was fed to the granules through a wick arrangement made up by Mr Holland.

The Transmitter remained mute but the results were very noisy. That is the sound was uncertain and blurry and while there was not much carbon noise still the tone was unnatural to my way of thinking this Gas Transmitter will have to be a very fine arrangement.

~~Jan~~ Feb 11 1920

Made Brian's moving magnet for trans. Iron 15 ft dia. 0 21 thick, iron 1" dia .006 thick, 9 ohms resistance no damp in sand no resistance on receiver end.

Weak, but at 0 feet and not near as good as Granular Transmitter at 15 ft distance

I will go back later and work on Magnetic as I think I can do much better than above.

February 1920

As my greatest trouble now seems to be still tone and blasty high note that is the top notes for the violin I decide to keep working on the magneto recorder.

I take a mica diaph. .003 thick 1 5/8" diameter and fasten same on a rubber gasket with rubber cement, this I fasten in cup with wax and rosin. As I am of the opinion that my trouble lies in the size of the iron work I start with a .006 thick and 1/2" diam. fastened on centre of mica with belomac and rosin. My results are good, heavy and noisy.
I increase diameter to 3/4" with same results.

I increase diameter to 1" with same results.

I increase diameter to 1 1/8 and get weaker but noise is still clear and blasty + n. G. on top notes

February 1920

I increase to 1 1/4" diameter and find no improvement in hardness on top notes and tone gets more and more.

I now try iron 11/1000 thick 1/2" dia. and while tone is improved over .006 thick iron still high notes are bad.

I increase diameter to 3/4" and tone is still better but high notes are still bad.

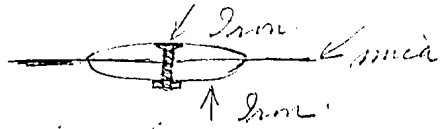
I increase to 3/4" and results are same or very little different

I increase to 1" diameter with same results.

I strike me now that it may be that the sticking of the iron on the mill and the wax & rosin may have some detrimental effect so I decide to make two Duncan pieces of iron 3/4" dia 11/1000 thick and fasten them

February 1920

with a small screw as below.



I make the screw concave so as to eliminate as much rattle or buzz as possible

This at last stops all trouble with the high notes and gives me a big unsupplied time and somewhat weak

The above results leads me to believe that the centre of the mica diaphragm must not be held as it will be if it is fastened with wax and rosin, as in the case of all my former experiments. For then the diaphragm becomes too stiff and resembles as a whole and cannot act quickly enough for fine vibrations. Having the foregoing in mind I am trying different shape domes but do not meet with much success because the magneto do not seem to get the correct field unless the surface is flat.

(1517)

however the line is not bad and as the heavy iron gave me my best results on the high notes and the concave iron fastened over the edges touching the mica diaphragm, I try an iron 1/32" thick 3/4" in diameter with a hole in centre 3/16 that is really a washer.

Results are very good in fact the best I have had since using 3 stages and the record of Berlin.

I now try a series of experiments on diaphragms on the recording side leaving the magnetic Mica and iron for a time. 1/32 thick 3/4" dia hole in centre 3/16.

Mica 1 5/8" dia 2/1000 thick too sensitive.
Same with Alum disc 3/4" dia .007 thick a little better but spotty

.003 thick 1 5/8" dia better but does not shine out of horn enough.

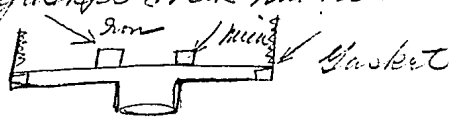
I now decide to decrease the dia. making it 1 9/16 also use laminated diaphragm. 1st mica 2/1000 thick 1 9/16 in diameter. 2nd .001 thick 1" in diameter 3rd 7/8" in diameter .001 thick and 4th 3/4" " .001 thick.

This is much brighter and gives best ~~yet~~ results to date, as far as standing out of the horn goes however the tone does not seem free enough and I attribute this to the diameter of the diaphragm, also ~~the~~ laminations.

In order to prove this I go back to the 1 5/8" diameter mica .002 thick rubber gasket fastened to metal with wax and the mica fastened to gasket with rubber cement. This diaphragm is on the recording side.

March 1920

The diaphragm on the magneto side is the same as the recorder side, in diameter but the thickness is 2½/1000. and fastened to metal in same manner as recorder side (gasket rubber, and mica to gasket with rubber cement.



I use an iron washer 1/32" thick 3/4" diameter. hole in centre 1/4"

Results are fine, big tone, good quality, stands out and holds well!

When using three stage condition I am compelled to put a small lamp 4 volts, in parallel and this of course acts as a shunt and somewhat shuns the record; however with two stage the results are plenty strong enough and the lamp can be removed and as far as quality is concerned there is a great improvement.

All trials are made at a distance of 15 feet.

I made up 6 recorders as near as possible following lines of last and it turned out very nearly alike which showed me that it was not an accident and experiment could be depended on.

April 1920

Mr Hilland brought me a half dozen new Audion Bulbs 3 Marconi and 3 Navy making my stock of bulbs 9 in all

I now try 1st 3 Western Electric Bulbs.
Results: Big tone loud and good quality

Marconi Bulbs
Results: Not so big a tone as Western Electric Bulbs but good quality & loud.

Navy Bulbs.
Results: Thinner than Marconi Bulbs and somewhat weaker but good quality

I now try two stages using different Bulbs and get some results as follows
Western Electric: Big tone
Marconi: Thinner than Western Electric
Navy: Thinner than W. E. & Marconi

April 1920

I now try combinations of different makes of Bulbs using 1st Western Electric Bulb on the 1st stage and Marconi Bulb on 2nd "
Results: Very fine Big tone, loud, and good quality

I now reverse the Bulbs and find
Results: Weaker, and thinner.

I now try Western Electric on 1st stage and Navy on second and get good results but find that the tone is not so big as when the Marconi is used on 2nd stage

I now try Marconi Bulb on 1st stage and Navy on second and get thinner results but not at bad bad in fact it might be a good combination to use on very heavy work.

April 1920 May 192

After trying different combinations of various makes of Bulbs I think that the G. E. are best, bring loud and fuller than either the Marconi or the Navy.

I now work with the 3 stage Audion but find I am compelled to use resistance across the transmitter circuit otherwise am troubled with carbon noises and also outside noises

Mr E. suggests the use of magnetic or resistance and I have collo wound of the different sizes I come, and while they have O.K. I find I have not the proper winding and size to control the current the way it should, and of course would try again.

June and July 1920

Mr E. has left the Studio in Columbia and I am now in the Garage in the Park. After setting up the apparatus I find that it is impossible to get any results as the presentation is so great that all I get is an awful mixup. I report this to Mr E and he suggests I work outside in the garden.

Now working in the Garden and using Hanley Audion

Using carbon transmitter 30 mesh Bakelite + Lamp Black mixed 3 stage with small resistance shunted across line near transmitter, and sometimes I can run reader and I am able to fairly well control volume and noise and results are quite good.

July 1920

I put my Bell Magneto on the transmitter end and used a 3 stage Audion cutting out the resistance altogether.

Results are fine, free from all noises and a good natural quality

I first tried a metal diaphragm in the transmitter and receiver ends but the quality was very metallic. I then put mica in the receiver end and it made a great difference

I now make samples for Mr E. H. Stolen Jr.

1st Samples with Magneto transmitter

2nd Samples with Carbon transmitter using different amounts of resistance in the receiver end.

Both sets of trials are made with the same receiver.

C(C)

Gas Meter reading Oct 25

Millions	Hundred thousands	Ten thousands
2 or 3	4	2

1 thousands

1

When ordering in the future mention
Size of Telescribe carbon diaphram
Diam = 1 5/16"
Thickness about .010
D. S. 18858

96"
18
27 64
10
37 6"
22
1564
10

Total weight = 19 3/4 lbs.
Cabinet " = 4 1/4
motor " = 6 1/2
Top plate & Arm " = 9

Standard single loom Machine
Total weight 26 1/2 lbs.

2/10/19
Lower Equipment = 44125 1/10
Charge.

26 1/2 = 25 6/4
19 3/4 19 3/4

50%

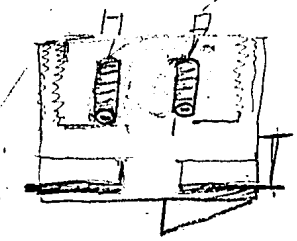
6 3/4 lbs. difference in weight of standard & Lower top plate machine.

40 4
100 10

36 1
10 3

90
36
54

27



90

36 1/10

10) 360 (90
360
0

36/10) 36 (3
30
6 3/10

6 36/10

3 3/10 5

6/10 6/10
6/10